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DIVISION 6
PHOTOBIOLOGY AND PHOTOCHEMISTRY
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December 2004 Newsletter Contents

2004 Meeting of Division 6 and the CIE Expert Symposium on Light and Health

Vienna, Austria

Minutes of the CIE Division 6 Meeting
September 27, 2004
CIE Central Bureau
Vienna, Austria

1. In Attendance:
George Brainard
Alexander Cabaj
Jean-Pierre Césarini
Francois Christaens
John Dowdy
Paul Donald Forbes
Teresa Goodman
Kohtaro Kohmoto
Hiroki Noguchi
John O'Hagan
Werner Horak
Uli Osterwalder
Lucia Ronchi
György Rontó
Robert Sayre
Janos Schanda
Karl Schulmeister
David Sliney
Shu Takeshita
Gerrit van den Beld
Jan van der Leun
Jennifer Veitch
Ann Webb
Stephen Wengraitis

2. Approval of Agenda. The agenda proposed in the May 2004 CIE Division 6 newsletter was circulated and accepted.

3. Approval of Minutes of the Previous Division 6 Meeting. Copies of the minutes from the previous Division 6 meeting in San Diego were circulated. The minutes were accepted pending a minor revision.

4. Division Director's Report. Ann Webb reminded the attendees that the upcoming CIE Expert Symposium on Light and Health Symposium would take place within the next several days. It was expected that the Symposium would be well attended, with over 100 persons registered at that time. She also reminded the attendees that the Tutorial on Light Measurement for Photobiology would take place the next morning at the CIE Central Bureau. It was reported that the Division 6 section of the International Lighting Vocabulary still needs to be balloted within the Division. It was agreed that the most current draft of the section would again be circulated, albeit with a shorter timeline than previous reviews of the document.

5. Secretary's Report. Questions were raised regarding the Division 6 website, as to who was responsible for updating. Stephen Wengraitis informed the Division that Bob Saunders of the National Institute of Standards and Technology was now updating the website, and that he was the main source to Saunders for providing updates and revisions to the website. Concerns were raised that various portions of the website required updating. Wengraitis encouraged the attendees to inform him regarding any required updates or changes, and also stated that he would review the website and send a new series of updates to Saunders.

6. Editor's Report. It was noted that the Editor, Myron Wolbarsht, was not in attendance, and no report was available at present.

7. Progress Reports from Technical Committee (TC) Chairs. Reports were given by the Chairs when present, or by colleagues in attendance.

6-08 Guidelines for Obtaining Action Spectra
David Sliney reported that this technical committee would meet after the meeting of Division 6.

6-11 Systemic Neuroendocrine Effects of Optical Radiation on the Human
Jennifer Veitch was pleased to report that this TC was completed and published as CIE Document 158:2004.

6-20 Phototoxicity in Domestic and Industrial Environments
Césarini announced that Neil Gibbs was likely to assume the role as new chair of this TC.

6-21 Cataractogenesis by Low-Level Exposure to

Ambient Ultraviolet Radiation
Sliney reported that a draft was under revision and would be circulated for review within the TC soon.

6-23 Develop Generalized Action Spectra for Plant Responses to Wavebands from 280 to 1100 nm
It was reported that a new chair, Stephan Flint, was ready to take over this TC effort. It was discussed that the Division should ensure that Flint's assumption of chair be properly approved.

6-24 Sunscreen and UV-A
6-28 Standardization of Sunscreen Testing; Method of UV-A Sunscreen Testing
6-31 Immediate Pigment Darkening
Césarini stated that a report would soon be forthcoming on TC 6-24. Regarding 6-28, Césarini stated that it appeared unlikely that a consensus would be reached at this time regarding a standardized method of UV-A sunscreen testing. This is because several methods are currently in use, and it is unlikely that professionals will recommend a test method different from their own test method. Such a recommendation could be interpreted as a statement that their test method is somehow inadequate compared to the recommended test method. Despite this impasse, after some discussion between Césarini and Sliney, it was recommended that this TC remain open pending future developments.

Regarding TC 6-31, Césarini stated that new chairs were currently being approached to continue this TC effort.

6-29 UV Protection and Clothing
Wengraitis reported for the chair, Peter Gies, that the TC report had been finalized by the committee, and needed to be balloted within Division 6. He stated that the report discussed fabric construction and other variables that may affect the protective quality of fabrics, as well as discussions of test methods and instrumentation, and areas where future research is needed.

6-32 Action Spectrum for Photocarcinogenesis
Forbes stated that a draft standard based on the TC report had been completed, with some recent changes, definitions and clarifications based on recent feedback.

6-33 Immunological Effects Mediated Through the Skin
Wengraitis reported that the chair, Edward de Fabo, had promised that a new draft would be available by the end of the year. It was asked whether or not Frank de Gruijl was a member of this TC; Wengraitis stated that he would follow this up.

6-35 Present State of UV Air Disinfection
Webb was pleased to report that this TC was completed, and published as CIE Document 155:2003.

6-37 Light and Retinal Disease
Sliney reported that this TC would have an informal meeting during the Light and Health Symposium.

6-39 UV Radiation in Lighted Environments
Kohmoto reported that this TC had met the previous day, and that there was a need to better-define the scope of the TC, specifically which "Lighted Environments" would be discussed regarding UV radiation exposure. Consensus seemed to indicate that "lighted environment" would discuss the lighted *indoor* environments, with possible contributions from outdoor radiation, rather than discussing all the possible sources and geometries of exposure of the *outdoor* lighted environment.

6-43 UV Water Disinfection
Cabaj reported that this TC was currently recruiting new members, and that it was expected that a new draft would be available by the end of the year.

6-48 Typical Minimal Erythema Doses
Wengraitis reported that he had been in contact with the chair, Janusz Beer, and that work was on-going with this TC.

6-50 Photodegradation of Pharmaceuticals
Wengraitis reported that he had been in contact with the chair, Steven Baertschi, and that the TC was active and recruiting new members.

6-51 Standardized Solar Simulator Spectral

Irradiance Distribution for Sunscreen Testing
Sayre reported that members of this TC would meet during the Tutorial and the Light and Health Symposium.

6-53 Personal Dosimetry for UV Radiation
Rontó reported that this TC was active and recruiting new members.

6-54 Standardised Action Spectrum for Vitamin D Synthesis in Human Skin
Webb reported that correspondence had taken place between her, Michael Holick and others, and that work on a draft was currently in progress.

6-55 Light Emitting Diodes
Werner Horak reported that his TC had met the previous day, and that there was a need for more feedback regarding the current draft. There had been some discussion at the TC meeting regarding the proper units for use in the documents (luminous intensity vs. radiance, with radiance being the preferred quantity), and also discussion as to whether the potential hazard from LED's should be evaulated with the LED being treated as a point source, a lamp, or something in-between.

6-56 Infrared Warming Cabins
Wengraitis reported that he was aware of correspondence from the chair, Jan Stolwijk, and that this TC had recently met and that the TC effort was on-going.

6-57 Standardized Terms and Action Spectra for Blue Light Hazard and Retinal Thermal Hazard Functions
Kohmoto stated that this TC had recently met in Japan, and that the TC effort was currently on-going.

TC's Flagged for Follow-Up:
6-15 A Computerized Approach to Reflection, Transmission, and Absorption Characteristics of the Human Eye
6-36 UV Protective Materials Used in Shading
6-42 Lighting Aspects for Plant Growth in Controlled Environments
6-44 Illuminators for Treatment of Infant Hyperbilirubinemia
6-45 Optical Radiation Hazard Measurements in the Work Space
6-46 Standard Action Spectrum for UV Disinfection
6-49 Infrared Cataract
6-52 Proper Measurement of Passive UV Air Disinfection Sources

8. Progress Reports from Reporters. Osterwalder stated that his reportership on UV absorbing clothing additives and changes with laundering was waiting on the publication of CIE TC 6-29.

Wengraitis reported that Eliyahu Ne'eman's TC report from Division 3 (TC 3-22) on Control of Damage to Museum Objects by Optical Radiation was completed.

9. Progress Reports from Liaisons with ICNIRP, WHO, IEC and ISO. Sliney (liaison with ICNIRP) stated that updates to hazard action spectra (for example, the UV, retinal thermal and blue hazard functions) should be kept in mind for any TC efforts involving these action spectra. He stated that the UV guidelines had been recently updated, and referred the attendees to the website www.icnirp.org.

Horak (liaison with IEC) stated that the CIE TC 6-47 on Photobiological Safety of Lamps and Lamp Systems had never fully closed, and that publication of a joint standard based on this document did not currently exist due to some points of discrepancy. It was discussed that there would be a need to contact Rolf Bergman (the chair of TC 6-47) regarding this issue, as well as Michael Seidl, and to have a joint CIE and IEC meeting on this subject.

It was stated that a guide on sunbeds had recently been issued by the WHO. No updates were provided on recent ISO activity.

10. Proposals for Dissolutions of TC's and Reporterships. No TC's or reporterships were proposed for dissolution.

11. Proposals for New TC's and Reporterships. Sayre proposed a new TC on Xeroderma Pigmentosum research, with Lesley Rhodes as chair. The background of this new proposed TC was as follows: there are people living with a condition known as xeroderma pigmentosum. Children with this condition cannot repair DNA damage, are highly skin sensitive, and typically die in their teens. There is a need to determine the risks from UV radiation in the indoor environment. Further, schools require public education on this subject, and there are no current safety standards for children with special UV protection needs. Reportedly, the UV radiation from indoor fluorescent lights would be high enough to give xeroderma pigmentosum patients skin cancer in less than 10 years of exposure. Césarini pointed out that an action spectrum for xeroderma pigmentosum already exists. The title "Guidelines for Protection and Safe Levels of UV Exposure to Xeroderma Pigmentosum Patients" was discussed, among others.

Another TC was proposed, in order to determine the optimum dose of UV radiation relative to skin type, in order to optimize vitamin D production for health while minimizing the risk of skin cancer. Several possible chairs were discussed, including Bill Grant, Eric van Rungen, and Michael Repacholi. Some concerns were expressed that such a TC would lead to an increase in people seeking to get tans through UVB and UVA radiation. Possible titles included "Optimum UV Exposure," among others.

UVC photocarcinogenesis from germicidal lamps was again discussed as a possible TC; Frederick Urbach had been discussed as a possible TC chair before his untimely passing.

12. Future Meetings. It was agreed that the next annual Division 6 meeting would take place in France in September 2005, in conjunction with the European Society for Photobiology meeting on September 3-8 in Aix-les-Bains, France.

13. General. Spirited discussions followed regarding the recent revisions of the Division 6 Section of the International Lighting Vocabulary. It was discussed that many persons who participate in Division 6 activities, (including the Division 6 members), received circulated copies of the section to be revised and had ample opportunities to provide feedback.

There appeared to be some confusion and need for explanation as to the specific process used by CIE to edit this document, awareness of the persons involved in the revision process, and the opportunities available for comments and subsequent revision. It was also stated that emphasis had been placed on limiting new terms as much as possible (and hence many suggested additional terms simply could not be included). However, new terms that could not be added to the International Lighting Vocabulary may possibly be added to the new "Division 6" glossary under development.

It was stated again that the most recent version of the Division 6 Section of the International Lighting Vocabulary would be recirculated for ballot, with a final deadline in December.

14. Adjournment. Ann Webb adjourned the meeting, wishing the attendees an enjoyable stay in Vienna, a productive experience at the Tutorial and the Light and Health Symposium.

SUMMARY TABLE OF DIVISION 6 TECHNICAL COMMITTEES

6-01 Actinic Effects of Optical Radiation on Man

TC Chair: Sandor Ferenczi

TC Status: Completed, published in 1987 report from Res Insti Techn Phys, Hungarian Academy of Sciences

6-02 Reference UV-Erythema Action Spectrum

TC Chair: Alistair McKinlay

TC Status: Completed, published in CIE Journal 6/1, 1987, CIE 106-1993.

6-03 Photo-kerato-conjunctivitis

TC Chair: Bernhard Steck

TC Status: Completed, published in CIE Journal 5/1, 1986.

6-04 Selected Photobiological Information

TC Chair: Charles C.E. Meulemans

TC Status: Closed at Durban meeting, 1997; data available, no publication.

6-05 Actinic Effects on Plants

TC Chair: G.S. Sarytchev

TC Status: Completed, published in CIE Journal 6/2, 1987.

6-06 UV Actinic Sources of Relevance To Illuminating Engineering

TC Chair: Kohtaro Kohmoto

TC Status: Closed, 1991, no publication.

6-07 Recommendation of the Methods of Measurement of Optical Radiation In Terms of Its Effects on the Corresponding Receivers

TC Chair: G.S. Sarytchev

Transferred to Division 2, TC 2-31, no publication.

6-08 Guidelines for Obtaining Action Spectra

TC Chair: New chair sought.

TC Status: Open.

Terms of Reference: Guidelines for Obtaining Action Spectra Definitions (detector, effective radiant quantities, responsivity, spectral responsivity, action spectra, threshold radiant exposure, threshold exposure period). Bunsen-Roscoe law; type of detectors; general relation between effect and irradiation; principles of obtaining action spectra; monochromatic irradiation; sources (random parameters); measurement of irradiance on the detector; measurement of the effect of irradiation.

Background: 1998 – Draft circulated and comments received. 2002 – Additional editing and revision recently performed by Erin Chaney. 2004 – TC met in Vienna, discussed history of the effort and the future direction of the TC.

6-09 Malignant Melanoma and Fluorescent Lighting

TC Chair: Bernard Muel

TC Status: Completed, published in CIE Journal 7/1, 1988.

6-10 Photobiological Effects on Human Skin

TC Chair: Maxim Mutzhas

TC Status: Completed, published in CIE 103-1993.

6-11 Systemic Neuroendocrine Effects of Optical Radiation on the Human

TC Chair: Jennifer Veitch

TC Status: Completed, published in CIE 158-2004.

6-12 Phototesting of Skin Application for Sun Protection (UV-B)

TC Chair: Jean-Pierre Cesarini

TC Status: Completed, published in CIE 90-1991.

6-13 Lighting Aspects of Large-Scale Plant Growing in Completely Protected Environments ("Dark Rooms")

TC Chair: G.S. Sarytchev

TC Status: Closed for inactivity; work assumed by TC 6-42.

6-14 Blue Light Photochemical Retinal Hazard

TC Chair: Kohtaro Kohmoto

TC Status: Completed, published in CIE 138-2000. Standard work now being performed.

6-15 A Computerized Approach to Reflection, Transmission, and Absorption Characteristics of the Human Eye

TC Chair: David Jack Lund; 7914 A Drive; Building 176; Brooks AFB, TX 78235-5138, USA; Tel (210) 536-4631; Fax (210) 536-3450; E-mail: Jack.Lund@brooks.af.mil

TC Status: Open.

TC Members: Not available.

Terms of Reference: Design a working model, for the assessment of the actual amount of radiation reaching various eye structures.

Background: 2000 – New chair appointed. Members sought. A draft report had been expected and not yet appeared. David Sliney will follow this up.

6-16 Psychobiological Effects of Lighting

TC Chair: Rikard Küller

TC Status: Completed, published in CIE 139-2001.

6-17 Spatial and Temporal Variability of Radiation Exposure and Human Behavior

TC Chair: Lucia R. Ronchi

1997 – Closed at Durban meeting, subject was discussed in a published document authored by Ronchi.

6-18 Evaluation of Potential Optical Hazards Associated with "Desk Top" Quartz Halogen Lamps

TC Chair: Alistair F. McKinlay

TC Status: Completed, published in CIE 103-1993.

6-19 Personal Dosimetry of UV Radiation

TC Chair: Joachim Barth

TC Status: Completed, published in CIE 98-1992.

6-20 Phototoxicity in Domestic and Industrial Environments

TC Chair: Jean-Pierre Cesarini; 83 Avenue Simon Bolivar ; Foundation Rothchild; 25, Rue Manin; 75019 Paris France; Tel : 011-33-1-480-36948 ; Fax: 011-33-1-480-36510 ; E-mail : jpcesarini@wanadoo.fr

TC Status: Open.

TC Members: Pr. J. Barth, Pr. F. Dall'Aqua, Pr. P. Thune, Mr. J. Unkovic, Montpellier, France

Terms of Reference: To define a ratio between the potential future and benefits of a given chemical versus the potential risk of phototoxicity and photoallergy.

Background: 1994 - A complete file of phototoxic and photoallergic compounds has been completed. They have been classified in 3 categories corresponding to: high frequency, and low frequency. Meeting is scheduled during 1994, after publication of the results of the European Community Commission. 2004 – Neil Gibbs has shown interest in assuming the chair of this TC.

6-21 Cataractogenesis by Low-Level Exposure to Ambient Ultraviolet Radiation

TC Chair: David H. Sliney; Commander, US Army CHPPM; MCHB-TS-OLO; Bldg. E-1950; APG, MD 21010 USA; Tel 410-436-3002; Fax: 410-436-5054; E-mail: David.Sliney@apg.amedd.army.mil

TC Status: Open.

TC Members: C. Barth, H. Taylor, S. Lerman, G. Perdriel, L. Ronchi, A. Medgyaszay, P. Sodenberg, R. Young

Terms of Reference: To evaluate the current biological and medical evidence relating to ultraviolet radiation cataract. UV-B radiant energy has been shown to cause cataract in experimental animals, but the evidence for UV-A cataract is much less convincing too many. 2001 - Chair recently updated current draft.

Background: Presently trying to resolve different points of view. Animal and human studies only point to UV-B; biochemical studies suggest UV-A. A draft report revised in 1994 and again in 1995. Report updated in 1998. 2004 – Draft under review, will be circulated soon.

6-22 Terminology and Units for Characterizing Photosynthetically Active Radiation for Plants

TC Chair: Ted W. Tibbitts

TC Status: Completed, published in CIE 106-1993.

6-23 Develop Generalized Action Spectra for Plant Responses to Wavebands from 280 to 1100 nm

TC Chair: Stephan Flint; Department of Forest, Range, and Wildlife Sciences; College of Natural Resources; Utah State University; Logan, UT 84322-5230; Tel: 435-760-3650; Fax: 435-797-3796; E-mail: sflint@cc.usu.edu

TC Status: Open

TC Members: Not available.

Terms of Reference: To develop generalized action spectra for plant responses to wavebands from 280 to 1100 nanometers.

Background: 2000 - Chair reported on progress and DD6 recommended summary report re: plant action spectra. 2003 – New chair sought, Martyn Caldwell and Stephan Flint considered; however, need to determine if Krizek is agreeable to this change. 2004 – Flint accepts position as new chair, commences recruiting of members for TC effort. Division needs to ensure that his assumption to the position of chair be properly approved.

6-24 Sunscreen and UVA

TC Chair: Jean-Pierre Cesarini; 83 Avenue Simon Bolivar ; Foundation Rothchild; 25, Rue Manin; 75019 Paris France; Tel : 011-33-1-480-36948 ; Fax: 011-33-1-480-36510 ; E-mail : jpcesarini@wanadoo.fr

TC Status: Open.

TC Members: Not available.

Terms of Reference: In view of the importance of UVA (in matter of skin premature ageing, skin carcinogenesis, immune local or systematic depression), and because of lack of existing regulations to test for UVA protection, it is proposed to extend the work of TC 6-12 (concerning UVB protection) on high protection factor (SPF) sunscreens. The goal is to arrive at an international consensus on sunscreen testing for UVA protection. 2000 - Report will discuss relative merits of test methods and discuss state of knowledge.

Background: Meetings were held in Chicago, 16-30 June 1993. ASP Meeting. A second meeting was held in Washington, D.C., December 1993, and in Scottsdale, June 1994. A third draft is in circulation; however, a great difficulty has been encountered in achieving an international consensus, since there are at least three tests being promoted: one on immediate pigment darkening, one on delayed pigmentation and one using a photosensitizer. A move by the US Food and Drug Administration or other major regulatory body could force a consensus, but the route to resolution is unclear at this time. Some favor a report on the status of sunscreen testing at this time and explaining each proposed method.

Group met in August 1997. Report by chair at the Gaithersburg 1998 meeting stated that the document was written, but still no international consensus existed on UV-A sunscreen testing. TC report may be written as a "current status" report.

At Warsaw 1999, chair discussed difficulties of achieving a consensus in the cosmetics, phototoxicity and solar-protection communities on sunscreen testing; hence the report will review the relative merits of the 3 methods and report the state-of-the-art.

At San Diego 2003, chair believed that the report would soon be ready for approval process. 2004 – Report should soon be forthcoming.

6-25 Spectral Weighting of Solar Ultraviolet Radiation

TC Chair: Stephen Wengraitis

TC Status: Completed, published in CIE 151-2003.

6-26 Standardization of the Terms UVA-1 and UVA-2

TC Chair: Jean-Pierre Cesarini

TC Status: Completed, published in CIE 134-1999.

6-27 Standardization of the Erythema Action Spectrum

TC Chair: Alistair F. McKinlay

TC Status: Completed, see TC 6-40.

6-28 Standardization of Sunscreen Testing: Method of UV-A Sunscreen Testing

TC Chair: Jean-Pierre Cesarini; 83 Avenue Simon Bolivar ; Foundation Rothchild; 25, Rue Manin; 75019 Paris France; Tel : 011-33-1-480-36948 ; Fax: 011-33-1-480-36510 ; E-mail : jpcesarini@wanadoo.fr

TC Status: Open.

TC Members: F. Wilkinson.

Terms of Reference: To develop standardized sunscreen testing procedures.

Background: 2000 - Group may correspond with similar TC 2-17. Much controversy exists over whether solar simulators are a good representation of real sunlight. Awaiting TC 6-24 report. Expect that report will discuss relative merits of test methods and discuss state of knowledge. At San Diego 2003, TC Chair stated that the report would be ready for approval process soon. 2004 – There was much discussion at the Division meeting as to whether this TC should be closed. It is unlikely that a consensus test method will be developed, due to the fact that several various test methods exist, and a different recommended method would implicitly be a statement that other methods are somehow flawed. It was decided that this TC would remain open.

6-29 UV Protection and Clothing

TC Chair: Peter Gies; Ultraviolet Radiation Section ; Non Ionizing Radiation Branch; Australian Radiation Protection and Nuclear Safety Agency; Lower Plenty Road; Yallambie VIC 3085; Australia; Tel: +61 (3) 9433 2285; Fax +61 (3) 9432 1835; E-mail: peter.gies@health.gov.au

TC Status: Open

TC Members: J-P Césarini, B L Diffey, C Driscoll, K Hatch, J Leland, U Osterwalder, M Pailthorpe, LR Ronchi, M Saito, R Sayre, D Sliney, N. van Tonder, S Wengraitis, F Wilkinson, C F Wong

Terms of Reference: To develop standardized methods to measure the sun protective factor of fabrics based upon realistic exposure conditions (e.g. wet and dry states).

Background: Chair was changed to Peter Gies in 1995. A number of labs around the world participated in round-robin testing of samples, and a second round was performed more recently. The most recent study provided further information on the advantages and drawbacks of different test methods. The results compared well and supported the TCs view that in vivo testing would not be a requirement for fabric testing. Dr. Gies is pulling together the results from all the studies and is writing an overview report. Recent editing included addition of national standards information, more-thorough discussion of factors affecting fabric transmission, uncertainties, additional references and figures.

2003- Much activity in this TC followed after the Division 6 meeting in San Diego in 2003. Much input was received from Kathryn Hatch, Uli Osterwalder, Masako Saito, and Masako Sasaki. Wengraitis is reviewing this information and incorporating it into a current draft. 2004 – Report is completed, and must now be processed at the Division level. Some comments have been received and are being reviewed.

6-30 Dosimetry of UVR Exposure – UV Protection of the Eye

TC Chair: C. F. Wong

TC Status: Completed, published in CIE 134-1999.

6-31 Immediate Pigment Darkening

TC Chair: Jean-Pierre Césarini; 83 Avenue Simon Bolivar ; Foundation Rothschild; 25, Rue Manin; 75019 Paris France; Tel : 011-33-1-480-36948 ; Fax: 011-33-1-480-36510 ; E-mail : jpcesarini@wanadoo.fr

TC Status: Open.

TC Members: A. Chardon, R. Mascotto, Kaidbey, H. Honigsman, M. Mutzhas

Terms of Reference: To develop a standardized action spectrum for IPD (after review of contrasting published results of testing for immediate pigment darkening).

Background: Preparation of a draft following the proposal by the former chairman (A. Chardon) to CIE Division 6 and COLIPA. Meeting of TC 6-24 and TC 6-31 in early 1995 was postponed. Dr. Césarini will circulate a draft to the TC based upon the study of Irwin and Chardon. The IPD is really only stable after 2 hours (Chardon); however, a consensus may require two action spectra: one for immediate, post-irradiation and one is for a 1-2 hour delay.

At Warsaw 1999, chair discussed that IPD was no longer a key aspect and the report would show the current state-of-knowledge. 2004 – New chairs are being approached regarding this effort.

6-32 Action Spectrum for Photocarcinogenesis (Non-melanoma skin cancers)

TC Chair: P. Donald Forbes

TC Status: Completed, published in CIE 138-2000. 2002 - Standard work now being performed. 2004 – The current standard draft is being edited based on feedback.

6-33 Photoimmunological Effects Mediated Through the Skin

TC Chair: Edward C. de Fabo ; Ross Hall, Room 101B; George Washington University Medical Center; Dermatology; 2300 I Street, N. W.; Washington, DC 20037; Tel: 202-994-3975; Fax: 202-994-3975; Email: ecd@gwuvm.gwu.edu

TC Status: Open.

TC Members: D. Godar, F. Noonan, D. Sliney, H. Tuschl, S. Wengraitis

Terms of Reference: To prepare a report on the current state of knowledge regarding the effects of UVR photoimmunology aimed for the lighting engineering community.

Background: Initial draft circulated to TC members. CB suggested that the final draft was not suitable for publication unless it was re-written for the non-medical specialist. Prof. Wolbarsht agreed to attempt a lay interpretation, March 1995. Miller of FDA recommended some editing. Report was sent to Helga Tuschl of Seibersdorf Austria in 1998, which provided a glossary of immunology terms. Report will be edited by de Fabo and Dianne Godar of FDA.
Sliney recommended that a comparison between several biologically-weighted spectra be added to the report. The light sources will include fluorescent lights and solar spectra, and the biological weighting functions will include DNA damage, the ACGIH actinic UV hazard function, and contact hypersensitivity. 2004 – Draft promised by year's end.

6-34 Testing Protocols for Photocarcinogenesis Safety Testing

TC Chair: P. Donald Forbes

TC Status: Completed, published in CIE 138-2000.

6-35 Present State of UV Disinfection

TC Chair: Richard Vincent

TC Status: Completed, published in CIE 155-2003.

6-36 UV Protective Materials Used in Shading

TC Chair: Natasha van Tonder; P.O. Box 395; Pretoria 0001; South Africa; Tel: +27 12 841-3618; Fax: +27 12 841-4458; E-mail: nvtonder@csir.co.za

TC Status: Open.

TC Members: F. Denner, S. DiDomenico, B. Diffey, C. Roy

Terms of Reference: To investigate the properties of materials, such as tent or awning fabrics used in solar UVR shading devices, and develop standardized methods for the testing fabrics other than clothing that are used for UVR protection.

Background: A major difficulty is to distinguish between material diffuse transmittance and area of the sky visible to the person under the shading material.

First meeting held in Gaithersburg 1998 under new chair (van Tonder). Studies will hopefully be completed within the next year.

A proposed protection factor based on shading material transmission, dimensions and shading geometry was discussed at the 1999 Warsaw meeting. At San Diego in 2003, van Tonder reported that a literature review had been completed in Istanbul and a measurement programme undertaken. The next step will be to develop and validate a mathematical model to predict shade ratios under different structures. This phase of work is scheduled for completion by the end of the year.

6-37 Light and Retinal Disease

TC Chair: David H. Sliney; Commander, US Army CHPPM; MCHB-TS-OLO; Bldg. E-1950; APG, MD 21010 USA; Tel 410-436-3002; Fax: 410-436-5054; E-mail: David.Sliney@apg.amedd.army.mil

TC Members: J. Marshall, M. Mainster, P. Gabel

Terms of Reference: To prepare a report on the current state of knowledge regarding the alleged effects of light exposure as an etiologic factor in retinal disease. The report should be written to be understood by the lighting engineering community.

Background: :Initial draft completed by Prof. Mainster, revised by Prof. Marshall, and then material on animal studies added by Dr. Reme. The final draft re-circulated in TC being reviewed by DD Editor to determine if a "lay translation" is required. New animal data was recently provided. Group met at Gaithersburg 1998 meeting.

2002 – Draft recently reviewed by Joan Roberts and Maria Ines de Wilde.

6-38 Photobiological Safety Standards for Lamps

TC Chair: David H. Sliney

TC Status: Completed, published in CIE 134-1999.

6-39 UV Radiation in Lighted Environments

TC Chair: Kohtaro Kohmoto ; Chiyoda Kohan Co., Ltd.; Ginza Toshiba Bldg. 7F, ; 2-1, Ginza 5-chome, Chuo-ku, Tokyo,; 104-8115 Japan; Tel 81-3-3575-0573; Fax: 81-3-3575-0596; E-mail: kohtaro.komoto@chiyodakohan.co.jp

TC Status: Open.

TC Members: Not available.

Terms of Reference: To develop an evaluation method of UV radiation at lighted environments. To investigate UV spectral characteristics of filters and reflectors used for luminances, and interior environment.

Background: Investigations have been completed and involve more than 50 lamps. Guidelines need to be established for lamps. Erythemal reference action spectrum may be used along with discussion of risk groups. 2002 – Draft recently discussed at 2001 Istanbul meeting. Language editing recently performed by T. Hansen, S. Wengraitis, USACHPPM. 2004 – TC met in Vienna, there was some discussion about the need to better define the definition of “lighted environments” to be used in the TC report, and discussion regarding the TC effort.

6-40 Erythema Reference Action Spectrum and Standard Erythema Dose

TC Chair: Brian Diffey

TC Status: Completed, published as CIE Std S007/E1998, ISO 17166:1999/CIE S 007/E-1998.

6-41 A Proposed Global UV Index

TC Chair: Elizabeth C. Weatherhead

TC Status: Completed, published in CIE 138-2000. CIE Standard S013:2003 published, based on work of this TC.

6-42 Lighting Aspects for Plant Growth in Controlled Environments

TC Chair: Harald Seidlitz; GSF-Forschungszentrum für Umwelt und Gesundheit GmbH; Institute fuer Bodenökologie / Arbeitsgruppe Expositionskammern; Ingolstaedter Landstraße 1; DE-85764 Oberschleissheim; Germany; Tel: +49-89-31872413; Fax: +49-89-31873389; E-mail: harald.seidlitz@gsf.de

TC Status: Open.

TC Members: Not available.

Terms of Reference: Define the general prerequisites for growing terrestrial plants in controlled environments and the characteristics of both commercial and research facilities. Discuss the economic constraints of commercial production facilities, and the critical optical radiation parameters for successful culture. Examine the interaction of optical radiation with other environmental parameters. Identify new and current optical sources suitable for plant culture.

Background: TC proposed at Durban meeting September 1997. Chair will likely be replaced by Seidlitz; changed due to health problems. Seidlitz was named the chair in January 1999.

6-43 UV Water Disinfection

TC Chair: Alexander Cabaj; Institut für Mediz. Phys. und Biostatis; Veterinarplatz 1; A 1210 Wien; Austria; Tel: 43-1-25077-4322; Fax: 43-1-25077-4390; E-mail: Alexander.Cabaj@vu-wien.ac.at

TC Status: Open.

TC Members: K. Kohmoto, J. Malley, R. Vincent , G. Van der Beld

Terms of Reference: To examine the state of knowledge on UV water disinfection

Background: TC proposed at Durban meeting September 1997. Dr. Vincent and Dr. Van der Beld will look for other possible members. J. Malley will prepare a first draft. Next meeting planned for Warsaw 1999. The three technical committees related to UVR disinfection met jointly at a discussion group of the Warsaw 1999 meeting. 2000 – New collaborative efforts being considered to move this TC forward. 2004 – Recruiting members, expect a draft by the end of the year.

6-44 Illuminators for Treatment of Infant Hyperbilirubinemia

TC Chair: Myron L. Wolbarsht; Dept. of Psychology; Box 90086; Duke University; Durham, NC 27708-0086; Tel: 919-660-5670; Fax: 919660-5672; Email: deryag@psych.duke.edu

TC Status: Open.

TC Members: Pratesi, K. Jailink , D. Sliney

Terms of Reference: To examine the state of knowledge on infant hyperbilirubinemia, and recommend the formation of a standardized action spectrum for comparative evaluation of therapy lighting.

Background: No action spectrum currently exists on infant hyperbilirubinemia, but data have been gathered. At Gaithersburg 1998, chair emphasized the need for manufacturers to create an illuminator that would provide constant output. Duke researchers have not only developed a control circuit to do this, but have also developed a meter to measure how much bilirubin is in the body by measuring the skin's reflectance 2000 – Some material submitted to chair to help with this effort.

6-45 Optical Radiation Hazard Measurements in the Work Space

TC Chair: Robert Angelo; Gigahertz Optik, Inc.; E-mail: b.angelo@gigahertz-optik.com

TC Status: Open.

TC Members: A. Barrett, Brose, Brueggemeyer, C. Driscoll, G. Hee, Hietanen, Jossen, K. Kohmoto, M. Morys, Ott, BauA, D. Sliney, B. Tengroth, U. Wester, T. Goodman

Terms of Reference: To examine the methods of measurement and the required accuracy of field instruments and broad-band meters used to measure the optical radiation hazards in the workplace. Emphasis is on UV and blue light hazards.

Background: Group and new recruits met at Gaithersburg 1998 and discussed a first draft for the report. 2001 – New TC chair. 2003 - Parallel work within CEN has slowed the work of this TC. The CIE and CEN documents have slightly different purposes, as the CIE document is more of a “background report” and the CEN document is more “prescriptive.” The two documents should send the same message and use the same vocabulary, however.

6-46 Standard Action Spectrum for UV Disinfection

TC Chair: Petra Rettberg; Radiation Biology; Linder Hoehe; D - 51170 Koeln; Germany; Tel: +49 2203 6014637; Fax: +49 2203 61970; E-mail: petra.rettberg@dlr.de

TC Status: Open.

Terms of Reference: To develop a standardized action spectrum for UV disinfection; DIN, US and other published action spectra are not consistent.

Background: Group met a Gaithersburg 1998, will gather data and then write first draft. Other members outside the USA will be sought. The three technical committees related to UVR disinfection met jointly at a discussion group of the Warsaw 1999 meeting

6-47 Photobiological Safety of Lamps and Lamp Systems

TC Chair: Rolf Bergman

TC Status: Completed, published in CIE Std S 009/E:2002.

6-48 Typical Minimal Erythema Doses

TC Chair: Janusz Beer; HFZ-114, 12709 Twinbrook Parkway; Rockville, MD 20852; Tel: (301) 443-7159; Fax: (301) 227-6775; E-mail: jzb@cdrh.fda.gov

TC Status: Open.

TC Members: A. Anders, J.-P. Césarini, B. Diffey, J.C. van der Leun

Terms of Reference: To propose typical minimal erythema doses for different skin types, for use in the evaluation and revisions of different standards for UV-emitting appliances and in educational efforts related to the risk of UV exposure.

Background: Met at Gaithersburg 1998. Defined the goals and ways to accomplish them. Proposed three categories of human skin for the purpose of artificial tanning. Proposed ways of development of tanning schedules using 3 levels of exposure.

Collection of information involves clinical research conducted by the U.S. FDA along with National Cancer Institute, Harvard University, Utrecht University, and Philips Research Laboratories. The study is conducted on a cohort of healthy volunteers representing six skin types (according to the Fitzpatrick classification) and six racial/ethnic origins (as defined by the U.S. Office of Management and Budget). The results of this study will be analyzed together with the other published and unpublished data to support the TC 6-48 document. Review of research results is currently underway. Results should provide background info for IEC work on sunbeds (how much UVR is required to get and maintain a tan). 2004 – work in progress.

6-49 Infrared Cataract

TC Chair: Myron L. Wolbarsht; Dept. of Psychology; Box 90086; Duke University; Durham, NC 27708-0086; Tel: 919-660-5670; Fax: 919660-5672; Email: deryag@psych.duke.edu

TC Status: Open.

TC Members: A. Cullen, E. Rydal, M. Mainster, T. Okuno, K. Sasaki, B. Tengroth, J. Zuclich.

Terms of Reference: Not available.

Background: Not available.

6-50 Photodegradation of Pharmaceuticals

TC Chair: Steven Baertschi; Eli Lilly and Company; Tel: (317) 276-1388; Fax: (317) 277-2154; E-mail: BAERTSCHI_STEVE_W@LILLY.COM

TC Status: Open.TC Members:S. Pugh, H. Tonnesen, N. Searle

Terms of Reference: Not available.

Background: 2002 – Piechocki reported that efforts mostly halted, due to retirement of some members and abandonment of the project by others. Consensus issues are highly unlikely. After some administrative confusion at Division 6, effort was assumed by Baertschi. 2004 – Active and recruiting members.

6-51 Standardized Solar Simulator Spectral Irradiance Distribution for Sunscreen Testing

TC Chair: Robert Sayre; Rapid Precision Testing Laboratories; P. O. Box 1342; Cordova, TN 38018-1342; Tel (901) 386-0175; Fax (901) 386-7218; E-mail: rptl@aol.com

TC Status: Open.

TC Members: J.-P. Césarini, F. Wilkinson, J. Chandon, D. Berger

Terms of Reference: To provide a standardized solar simulator emission spectrum for testing susncreens. Spectral tolerance values will be provided.

Background: 2000 - Chair reported drafting an initial proposal for a spectral distribution. 2003 - In a joint meeting with TC 6-28 in San Diego, Sayre was asked to expand the scope of this TC to include photoxicity testing.

6-52 Proper Measurement of Passive UV Air Disinfection Sources

TC Chair: Richard Vincent; Manager and Lighting Specialist; Department of Community Medicine; Saint Vincents Hospital and Medical Center; 153 W. 11th Street; New York, NY 10011; Tel: (212) 604-8034;; Fax: (212) 604-7627; E-mail: vincentrl@msn.com

TC Status: Open.

TC Members : A. Cabaj, R. Bergman, K. Kohmoto

Terms of Reference: To specify the biologically meaningful distances and positions in installations of UV germicidal lamps for open, upper-air disinfection.

Background: Vincent has reported that a Lighting Research Centre publication on this subject had been completed and he was now forming a TC to work on the CIE report.

6-53 Personal Dosimetry for UV Radiation

TC Chair: Gerda Horneck; DLR FF-ME, Radiation Biology; Linder Hoehe; 51147 Koeln; Germany; Tel: (49)2203-601-3594; Fax: (49)2203-61970; E-mail: Gerda.Horneck@dlr.de

TC Status: Open.

TC Members: Not available.

Terms of Reference: Not available.

Background: 2001 – TC recently met, discussing the structure of the report and assigning report tasks to TC members. 2003, 2004 -Work reported to continue on-going.

6-54 Standardised Action Spectrum for Vitamin D Synthesis in Human Skin

TC Chair: Michael Holick; 715 Albany Street, M-1013; Boston, MA 02118; Phone: (617) 638-4545; Fax: (617) 638-8882; E-mail: mfholick@bu.edu

TC Status : Open.

TC Members: R. Bouillon, J. Eisman, M. Garabedian, F. Glorieux, B. Dawson-Hughes, G. Jones, S. Reddy, T. Suda, I. Terenetskaya, A.Webb

Terms of Reference : To evaluate the current state of knowledge in the photobiological action spectrum for the production of Vitamin D in human skin, and to propose a standardized action spectrum for general use in estimating effective exposures in humans of differing skin types. The Technical Committee will examine the impact of natural skin pigmentation, skin optics, and skin exposure area and describe the effective dose per unit of skin area that produces a given quantity of serum Vitamin D. The output will be a technical report and standard.

Background: Draft report has been circulated. Theoretical spectrum could be calculated using chemical kinetics, skin optics. This could be compared with the original experimental work and animal studies to clarify the extreme endpoints. 2004 – A draft is in progress and there has been active correspondence on this TC.

6-55 Light Emitting Diodes

TC Chair: Werner Horak; Siemens AG; CT ES RD; Corporate Office for Radiation Safety and Dangerous Goods Transportation; Otto-Hahn-Ring 6; D-81730 Munich; Germany; Tel: +49 89 636 47059; Fax: +49 89 636 40162; Email: wener.horak@siemens.com

TC Status: Open.

TC Members: Not available.

Terms of Reference: To report on the differing methods of assessing the photobiological safety of Light Emitting Diodes (LEDs). The assessment measures in the CIE Lamp Safety Standard, CIE S009/E:2002 will be compared to the measures in IEC 60825-1-2001. This entails a review and report on the known effects from a physiological standpoint and a determination of the dose relationships that pose a potential risk for eye injury from excessive irradiation.

Background: There is a problem as to whether to classify an LED as a laser or a lamp for safety evaluations – both have merits and both present problems, depending on how the LEDs are arranged and used. In Europe LEDs have to be classified as lasers due to the IEC low voltage regulation. A report of a comparison of laser/lamp and CIE/IEC regulations (with some surprising results) was circulated to the TC members, but there has been no response to date. There was a call for new members of this TC. 2003 – TC met and discussed issues extensively at meeting in San Diego.

6-56 Infrared Warming Cabins

TC Chair: Jan Stolwijk; 3705 Green Ash Court; Beltsville, MD 20705; Tel: (+1) 301 937-1945; Fax: (+1) 301 595-9788; E-mail:stolwijk@prodigy.net

TC Status: Open.

TC Members: Maila Hietanen, Hans Meffert, Wolfgang Schmidt, Karl Schulmeister, David Sliney, Frederick Urbach (US)

Terms of Reference: To report on the potential health benefits and risks in the use of far-infrared heating cabinets, sometimes referred to as infrared “saunas.” This entails a review and report on the known effects from a physiological standpoint and to determine the dose relationships that poses a potential risk for skin injury from excessive irradiation.

Background: A TC meeting was held in San Diego. A report is nearing completion but it was suggested that some Japanese scientists be invited to join the committee as Japan is where IR cabins are widely used, and where many of the health claims (unsubstantiated in the West) originate.

6-57 Standardisation of Terms and Action Spectra for Blue Light and Retinal Thermal Hazard

TC Chair: Kohtaro Kohmoto; Chiyoda Kohan Co., Ltd.; Ginza Toshiba Bldg. 7F, ; 2-1, Ginza 5-chome, Chuo-ku, Tokyo,; 104-8115 Japan; Tel 81-3-3575-0573; Fax: 81-3-3575-0596; E-mail: kohtaro.komoto@chiyodakohan.co.jp

TC Status: Open.

TC Members: Not available.

Terms of Reference: Not available.

Background: 2004 – TC had first meeting in Japan; effort is on-going.

Proposed TC* – UVC Photocarcinogenesis from Germicidal Lamps. A TCC needs to be identified before this can be approved by the Board.

Proposed TC* –Guidelines for Protection and Safe Levels of UV Exposure to Xeroderma Pigmentosum Patients. This was proposed in Vienna 2004, with Lesley Rhodes suggested as chair. The background of this new proposed TC was as follows: there are people living with a condition known as xeroderma pigmentosum. Children with this condition cannot repair DNA damage, are highly skin sensitive, and typically die in their teens. There is a need to determine the risks from UV radiation in the indoor environment. Further, schools require public education on this subject, and there are no current safety standards for children with special UV protection needs. Reportedly, the UV radiation from indoor fluorescent lights would be high enough to give xeroderma pigmentosum patients skin cancer in less than 10 years of exposure. Césarini pointed out that an action spectrum for xeroderma pigmentosum already exists. The title “Guidelines for Protection and Safe Levels of UV Exposure to Xeroderma Pigmentosum Patients” was discussed, among others.

Proposed TC* - Division 5 has approved a reportership on the Effects of (Outdoor) Lighting on Ecosystems, under the chairmanship of Scott Davis (US). They seek D6 members for a potential TC on this subject and propose a joint meeting or workshop at the mid-sessional when the initial report should be available.

Proposed TC* – Optimum UV Exposure for Health. Intention of TC is to suggest optimal dose of UV radiation relative to skin type, in order to optimize vitamin D production for health while minimizing the risk of skin cancer. Some concerns were expressed that this could lead to an increase in people seeking to get tans, even though research has suggested that the levels of exposure required for health are below this level. Suggested chairs included William Grant, Eric van Rungen, and Michael Repacholi.

Proposed TC* – Spectral Weighting of Simulated Solar Ultraviolet Radiation. Purpose of this TC would be to prepare a document intended to provide health research scientists with a concise reference for estimating the risk associated with exposure to various levels of simulated solar radiation.

The first phase of this proposed effort will evaluate data related to the xenon long-arc lamp, representing both ideal and realistic operating conditions. The document will provide the following: 1) tables of irradiances; 2) tables of established weighting functions for several photobiological effects; and 3) tables and charts of photobiologically effective irradiances (derived from 1 and 2). Similarly, subsequent phases will evaluate, tabulate and chart data from other "solar simulator" devices of interest to investigators in research and testing laboratories.

*TC name is not official at this time; TC has not completed the approval process.